

REMARKS

Favorable reconsideration of this application, in light of the preceding amendments and following remarks, is respectfully requested.

Claims 1, 2 and 11 are pending in this application. No claims are amended, added or cancelled. Claims 1 and 11 are the independent claims.

Example Embodiments of the Present Application

Independent claims 1 and 11 recite “an organometallic composition comprising organometallic compound (I) of Formula 1 containing Ag and a neutral metallic ligand having photosensitivity, organometallic compound (II) of Formula 2 containing at least one of Au, Pd and Ru, and organometallic compound (III) of Formula 3 containing at least one of Ti, Ta, Cr, Mo, Ru, Ni, Pd, Cu, Au and Al”. Example non-limiting embodiments of this feature are discussed throughout the instant specification.

Example embodiments relate to forming a metal alloy pattern using organometallic compounds which are made by adding organic compounds into metals (Ag, Au, Pd and Ru). Example embodiments provide organometallic compounds to overcome relatively low adhesion of the metals which may be an issue if the metals are used alone.

In example embodiments, the method of forming a metal alloy pattern may include relatively simple steps and example embodiments could be applied to forming a metal alloy pattern without CVD process which should be carried out under relatively high temperatures and/or relatively high pressures.

A non-limiting example embodiment of the organometallic composition is explained in paragraph [0021] of the present specification. The sensitivity to light that is a characteristic of the organic ligand of Formula 1 allows the organic ligand to become readily dissociated from the

central metal. In addition, the ternary organometallic composition comprising the organometallic compounds of Formula 2 and 3 need not be photosensitive and are mixed uniformly within the prescribed range in the composition.

Rejections under 35 U.S.C. § 103

Claims 1-2 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent No. 2001-221908 (Furuya) in view of U.S. Patent No. 6,184,403 (Welch). Applicants respectfully traverse this rejection for the reasons detailed below.

Furuya and/or Welch, as relied upon by the Examiner, fails to suggest an organometallic composition comprising organometallic compound (I) of Formula 1 containing Ag and a neutral metallic ligand having photosensitivity, organometallic compound (II) of Formula 2 containing at least one of Au, Pd and Ru, and organometallic compound (III) of Formula 3 containing at least one of Ti, Ta, Cr, Mo, Ru, Ni, Pd, Cu, Au and Al as recited in independent claims 1 and 11.

The outstanding Office Action on page 5, lines 10-16, acknowledges that Furuya fails to disclose “the organic compound is the claimed neutral ligand and the organic-metal complex includes the anion recited in independent claims 1 and 11” and relies on the teachings of Welch for these features of claims 1 and 11.

In addition to the above-identified deficiencies of Furuya, Applicants respectfully submit that Furuya does not disclose an organic metallic composition as the Examiner claims, but discloses only alloys produced as a film on a substrate by sputtering metals, which is different from the organometallic compound disclosed in independent claims 1 and 11. Also, the starting materials and process in Furuya are different from those disclosed in independent claims 1 and 11.

In addition, independent claims 1 and 11 disclose an organic ligand of Formula 1 that is photosensitive, which allows the ligand to become readily dissociated from the central metal. Furuya discloses a reflection film consisting of AgPdX, AgAuX, wherein X is Cu or Ti, and not an organometallic composition comprising the organometallic compounds in Formulas 1, 2 and 3 nor a photosensitive organic ligand as disclosed in independent claims 1 and 11.

In regards to Welch, on page 3 of the Office Action, the Examiner states that Welch includes a neutral metallic ligand such as NR⁹, wherein R⁹ comprises an alkyl group, and a nitro or carboxylate anion. Although NR⁹ could be similar in chemical structure to the neutral metallic ligand L of example embodiments, Applicants respectfully submit that NR⁹ is not a neutral metallic ligand, but a replacement material for oxygen in metal diketonate complexes of Welch. Furthermore, there is neither a disclosure nor a suggestion in Welch that NR⁹ could be a neutral metallic ligand, e.g., no discussion of technical advantages of NR⁹ and examples using NR⁹ as the neutral metallic ligand in Welch.

In addition, Applicants respectfully submit that CVD precursors having increased volatility and chemical stability in Welch can be obtained by including the organometalloid compound having the structure of formula I, which is used as a ligand. The neutral metallic ligand L of example embodiments is different from the ligand expressed as the organometalloid compound of Welch in that the neutral metallic ligand L includes neither metalloid, e.g., Si, Ge, Sn, and Pb, nor diketonate bone.

Furthermore, volatility of the ligand of independent claims 1 and 11 is due to photosensitivity, but Welch teaches volatility of CVD precursors including a neutral metallic ligand. The organometalloid compound of Welch is made for CVD precursors, whereas example embodiments do not require a CVD process. The organometalloid compounds having the structure of formula I based on β -diketonates are bidentate ligands in Welch allowing for more

stable metal complexes than monodentate ligands could do, e.g., a chelate effect. As a result, the organometalloid compounds of Welch are much less sensitive to light than the organometallic compounds of example embodiments. In other words, the metal complexes in Welch could not be decomposed although they are exposed to light similar to example embodiments. Finally, there is no specific example in Welch regarding photolytic decomposition in Welch.

Because neither Furuya nor Welch teaches an organometallic composition comprising organometallic compound (I) of Formula 1 containing Ag and a neutral metallic ligand having photosensitivity, organometallic compound (II) of Formula 2 containing at least one of Au, Pd and Ru, and organometallic compound (III) of Formula 3 containing at least one of Ti, Ta, Cr, Mo, Ru, Ni, Pd, Cu, Au and Al as recited in independent claims 1 and 11, the alleged combination of Furuya and Welch also cannot teach “an organometallic composition comprising organometallic compound (I) of Formula 1 containing Ag and a neutral metallic ligand having photosensitivity, organometallic compound (II) of Formula 2 containing at least one of Au, Pd and Ru, and organometallic compound (III) of Formula 3 containing at least one of Ti, Ta, Cr, Mo, Ru, Ni, Pd, Cu, Au and Al” as recited in independent claims 1 and 11.

With respect to the proposed combination of Furuya and Welch, Applicants respectfully submit that the combination is improper for at least the following reasons.

Furuya is directed to a reflector (which is a technical field different from example embodiments), whereas the teachings of Welch describe MOCVD precursors. Accordingly, Applicants respectfully submit there is insufficient evidence in the record for modifying the reflector of Furuya to incorporate the MOCVD precursors of Welch. Additionally, neither Furuya nor Welch recognize the solution thereto regarding the composition ratio of the organometallic compounds of Formula 1, 2 and 3.

Further, Applicants respectfully submit that an attempt to bring in the isolated teachings of the MOCVD precursors of Welch into the reflector of Furuya would amount to improperly picking and choosing from the different references without regard for the teachings of the references as a whole.¹

The Applicants maintain, therefore, that the Action does not present the required "convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references," *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985), and that this rejection may not be properly maintained absent such reasoning.

The Applicants, therefore, respectfully request that the rejection to Claims 1-2 and 11 under 35 U.S.C. § 103 be withdrawn.

Claim 2, dependent on independent claim 1, is patentable for the reasons stated above with respect to claims 1 and 11 as well as for their own merits.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection to independent claims 1 and 11 and all claims dependent thereon.

¹ See *In re Ehrreich* 590 F2d 902, 200 USPQ 504 (CCPA, 1979) (stating that patentability must be addressed "in terms of what would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the sum of all the relevant teachings in the art, not in view of first one and then another of the isolated teachings in the art," and that one "must consider the entirety of the disclosure made by the references, and avoid combining them indiscriminately.")

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Erin G. Hoffman, Reg. No. 57,752, at the telephone number of the undersigned below.

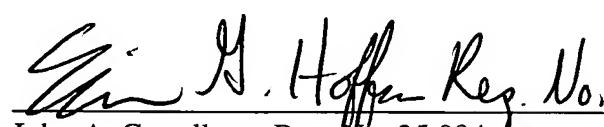
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By

for


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